

# **EXHIBIT B**

Already cars like the Audi A8, the BMW 7, 5 and 6 series, the E and S class of Mercedes-Benz up to the superior models of Rolls-Royce and Maybach, and also the Smart Roadster, amongst others, contain a MOST network, a total of 20 models at the end of 2003. It is set to reach more car models in the mid-range platforms like the Daimler A and C class, and the BMW 1 and 3 series bringing mass-produced MOST cars onto the road in 2004.

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### **About Hyundai Autonet Co., Ltd.**

Hyundai Autonet is realising its vision of becoming a mobile and network leader very fast, advancing from a leading position in the Korean market into a highly competitive global company. Hyundai Autonet was spun off from the Electronics Division of the former Hyundai Electronics Co., Ltd. in April 2000. Major products include multimedia equipment such as car audio, AV, navigation, and telematics systems, and a variety of electronic control units (ECU) such as airbags, body control modules, engine control modules, tire pressure warning systems, trip computers, back warning systems (BWS), and parking assistance systems.

For more information, please see: <http://www.hyundaiautonet.com>

### **About Fujitsu Microelectronics Europe**

Fujitsu Microelectronics Europe (FME) is a major supplier of semiconductor and display products. The company provides advanced systems solutions to the automotive, digital TV, mobile telephony, networking and industrial markets. Engineers from design centres dedicated to microcontrollers, mixed-signal, wireless, FRAM, multi-media ICs and ASIC products work closely with FME's marketing and sales teams throughout Europe to help satisfy customers' system development requirements.

This solutions approach is supported by a broad range of advanced semiconductor devices, IP and building blocks as well as leading-edge Plasma Display Panels..

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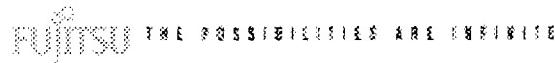
A medium resolution picture relevant to this press release can be found by following the link:

<ftp://ftp.jdk.co.uk/Fujitsu/Press/MRPR812.jpg>

For a high resolution download option please follow the link:

<ftp://ftp.jdk.co.uk/Fujitsu/Press/HRPR812.zip>

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Fujitsu Microelectronics Europe

## Fujitsu Presents First MOST® Car Infotainment Product

**Munich, November 9, 2004** — Fujitsu Microelectronics Europe (FME) is demonstrating on its stand at Electronica, the first complete solution designed using its components for a MOST (Media Oriented System Transport) Multimedia Car Infotainment system.

Hyundai AUTONET Co. Ltd. (HACO) of Korea has developed modules for MPEG transmission over MOST with the aim of exploiting MOST technology not only for Audio and control, but also for Video transmission. The modules will find applications in 2 product classes:

- Driver Information System II (DIS II) as a Total Network System including MOST, Wireless and CAN Networks. The MOST network is used for distribution of Multimedia content, the Wireless Network is used for CDMA, GSM and private phones and CAN for Body Control Area. All three networks offer future oriented functions and are interoperable for maximum driver satisfaction.
- Multimedia Information System (MIS) targets Rear-seat Entertainment Systems for OEM (Original Equipment Manufacturer) and Aftermarket products. It only includes the MOST Network for distribution of multimedia content and focuses on multiple screens in the car.

The processing of analogue signals from TV and DVD players is based on Fujitsu's reference system VideoCompressor4MOST developed by OASIS SiliconSystems. The Fujitsu MPEG Encoder compresses the analogue signal adjusting the bandwidth according to the MOST busload.

Fujitsu's SmartMPEG decompresses the MPEG content transmitted via MOST and provides the decoded Video to the front and rear seat displays with the corresponding OSD (On Screen Display).

Fujitsu's Graphic Display Controller (GDC) Coral-P is the key component in the Car Navigation system for sophisticated 3D/2D Graphics (GUIs, maps, etc).

The MPEG Decoder and GDC elements were designed by HACO, as opposed to the MPEG Encoder, whose circuit was adopted from an existing Fujitsu reference system. This strategy meant that HACO was able to reduce the development time to just 6 months. This timeframe also included any specific modifications required.

"The extremely short development time shows the advantage of using Fujitsu components and the synergies between HACO, FME and OASIS, resulting in products which will revolutionise the car entertainment market," said Miguel Estevez, Senior Marketing Engineer at Fujitsu Microelectronics Europe.

"Without FME's powerful support we could not have anticipated developing any products with such a short lead time. Fujitsu supplied excellent documentation and resources to develop its products from scratch, and also offered a fast email Q&A service. We firmly believe that Video transmission over MOST will gradually increase in the MOST system and Fujitsu's chip will be utilised more and more," said Jack Kim, Car Network Technical Manager at Hyundai Autonet.

MOST technology combined with Fujitsu components, which are cutting edge in the automotive market, increases system flexibility and service configuration speed for end users compared to existing state-of-the-art analogue systems. The multimedia content on the MOST Bus can be selected in all possible combinations, so that all passengers can decide on services individually, i.e. full network functionality is available. The car, as a multimedia infotainment centre, is already a reality.

## MOST: The Automotive Industry's Networking Technology Standard

Based on a fibre-optic bus, MOST has emerged as the automotive industry's high-speed digital networking standard. It serves as the backbone technology of in-car infotainment systems. The use of the MOST networking technology permits car manufacturers and suppliers to easily add a host of multimedia devices, such as CD players, AM/FM radios, TVs, DVD players, navigation systems, cell phones, and in-car PCs, as modular functions in the automotive environment, while meeting the specific requirements of any vehicle.

Raphael Hilmi

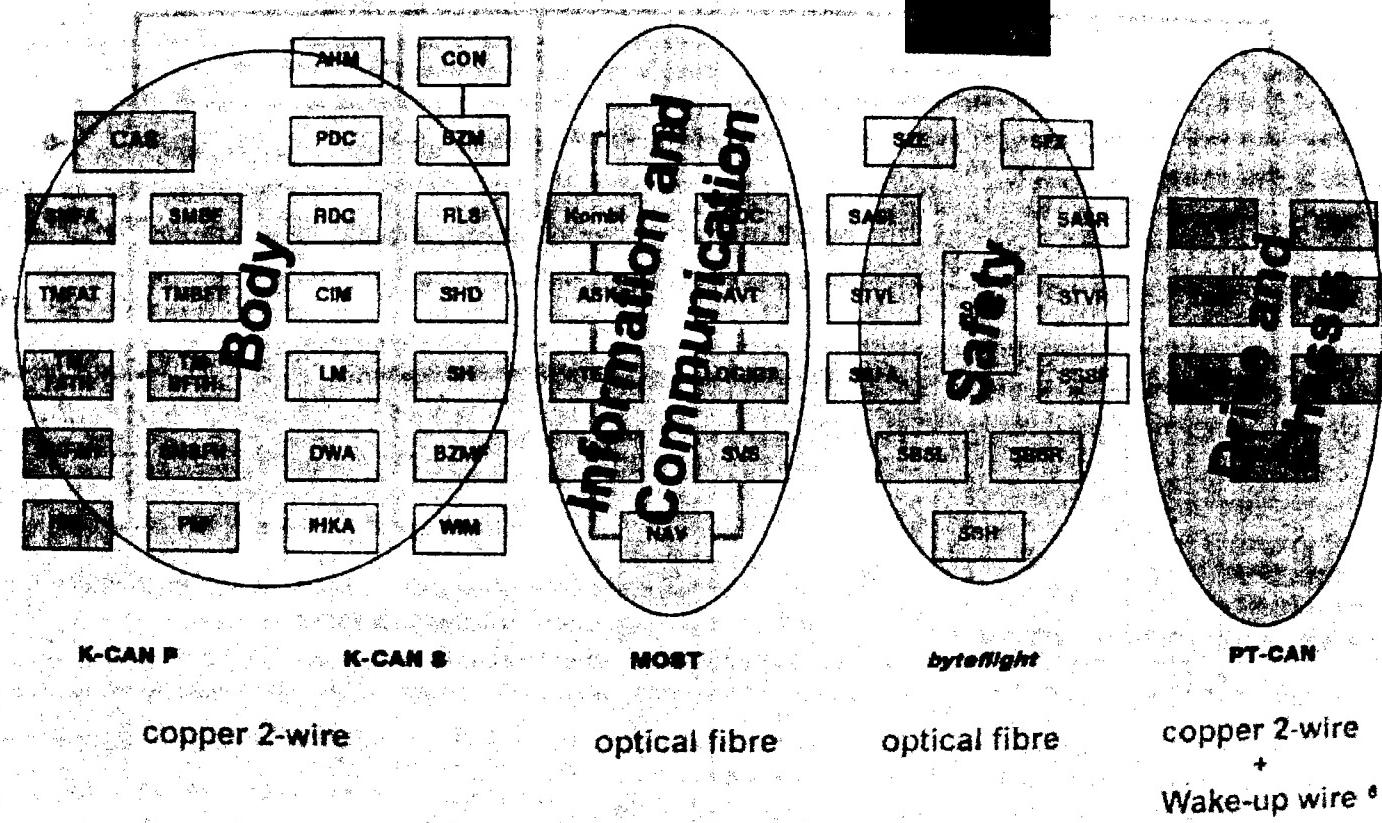
Address Service Manager  
491 East Marine Drive, Route 1  
Dededo, Guam 96929-6225 U.S.A.Tel: 1-671-633-2698 Ext: 108  
Fax: 1-671-633-0888  
E-mail: rhlmi@  
prestigeautoguam.com

## **BMW Group Service Training International Trainer Conference July 2001**

### **Introduction E65/E66 Vehicle Electrical System**



## **Overview**



G McDougall  
ZG-A-38  
August 2001

## **E65 Bus Network**

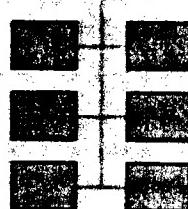
### **E65 bus networks**



#### **K-CAN**

##### **Body**

- EMC compatible
- higher data transmission resolution
- 9.1 MBit/s



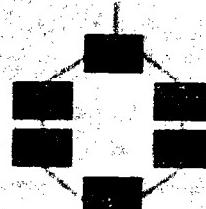
**Tree-Structure**

copper 2-wire

#### **MOST**

##### **Information and Communication**

- continuous digital signal (Audio, Video)
- frame network
- 22.5 MBit/s



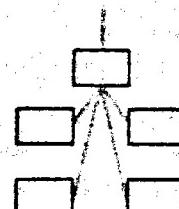
**Ring-Structure**

optical fibre

#### **byteflight**

##### **Safety**

- system ISIS
- reliable
- sections work separately
- 10 MBit/s



**Star-Structure**

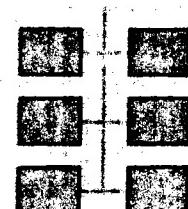
optical fibre

#### **PT-CAN**

##### **Drive and Chassis**

- quickest CAN in E65/E68
- separate wake-up wire

- 0.5 MBit/s



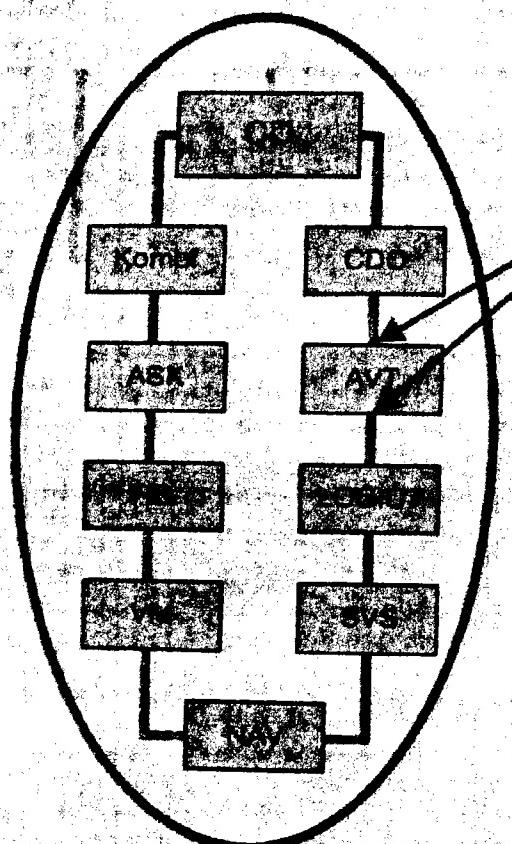
**Tree-Structure**

copper 2-wire

+  
Wake-up wire

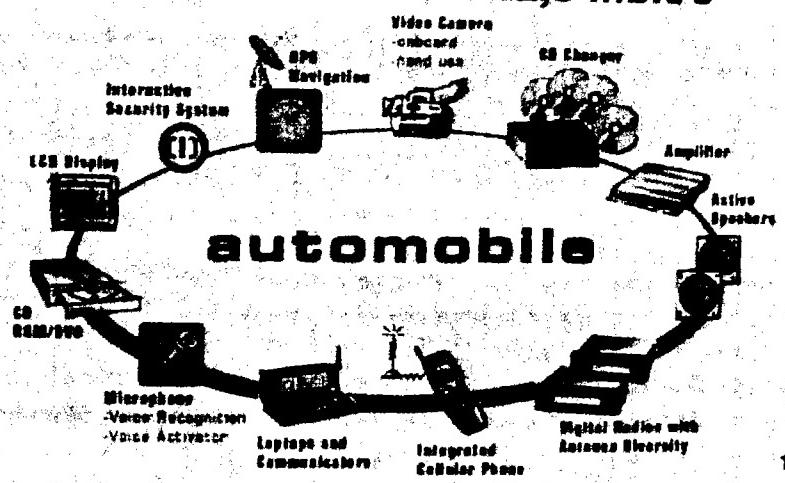
G McDowell  
ZG-A-82  
August 2001

## E65 Bus Network Optical fibre technology



## MOST

**Ring structure**  
**Separate sender and receiver**  
**Large amount of data**  
**Audio-Data and Video-Data**  
**Frame network**  
**Data transmission: 22,5 Mbit/s**



BMW Group Australia  
Alternatives

B McDowell  
20-A-28  
August 2007

## E65 Bus Network Optical fibre technology



*byteflight*

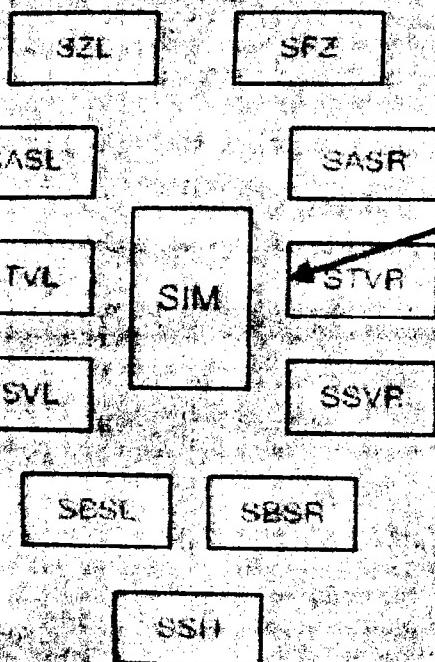
**Star structure**

**Integrated sender and receiver**

**High demand on safety data transmission**

**Satellites work separately**

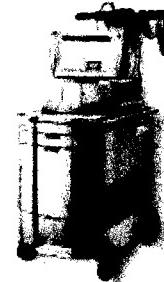
**Data transmission: 10 Mbit/s**



**BMW Group Australia**  
Australia

## Bus diagnosis

All models from E60



### Introduction

In the vehicles of today, components and control units are networked by means of data buses. Data buses are capable of transmitting messages with signals.

The connected control units only read off those messages and signals that are of relevance to their operation.

Most buses are CAN buses (CAN: Controller Area Network). There are several CAN buses with different data transmission rates in each car.

For example, the PT-CAN has a fast data transmission rate, the K-CAN a slower data transmission rate. A fibre-optic cable is used for navigation and entertainment: the MOST bus (MOST = "Media Oriented System Transport")

There is a separate data wire for diagnosis: the diagnosis wire, also known as the "K-wire". [for more information, please refer to SI Technology (SBT) 61 03 05 144]

The following options are available for locating faults in data buses and in control units:

- **Test module for diagnosis on the CAN buses in the BMW diagnosis system:  
"Bus system analysis"**  
The test module is called up in the DIS (Diagnosis and Information System) as follows: "Function selection" button -> Complete vehicle -> Body -> Bus functions -> Bus analysis -> System analysis
- **Checking the terminating resistances:**

The test module is called up in the DIS (Diagnosis and Information System) as follows: "Function selection" button -> Complete vehicle -> Body -> Bus functions -> MOST functions -> MOST system analysis.

These two test modules and the installation points of the terminating resistances are described in detail below.

### **Bus system analysis**

The bus system analysis narrows down the cause of **intermittently** occurring faults in the area of the data buses and control units.

The test results of bus system analysis state the following possible causes of fault:

- Data bus XY defective
- Gateway XY defective (= interface for data exchange)
- Control unit XY defective

**Note: Diagnosis of intermittent faults and permanent faults.**

All cases where a data bus or control unit only fail **temporarily** (i.e. intermittently) are difficult for diagnosis.

In such cases, the entries in the control units' fault memories do not point unambiguously to an intermittent failure of a particular data bus or control unit.

**Intermittent failure of a particular data bus or control unit causes many different fault memory entries in several control units.**

If a data bus fails **completely and permanently**, the affected control units are no longer available for diagnosis. The fault is thus easy to locate.

**Note: Path details for the "bus system analysis" test module**

The test module is called up in the DIS (Diagnosis and Information System) as follows:

"Function selection" button -> Complete vehicle -> Body -> Bus functions -> Bus analysis -> System analysis

In order to determine the cause of a system fault in the bus system the following prerequisites have been established:

- If a communication fault occurs in the control units of the bus system, then this communication fault is not shown in the fault memory of the control unit concerned. This also means that no "x" appears before this control unit in the short test.
- The quick-test list contains "real" installed control units and a "virtual" control unit with following names:
  - "CAN/byteflight system analysis" on the E65, E66 and on the E60, E61, E63, E64 up to 09/2005
  - "CAN system analysis" on the E87, E90, E91, E92, E93 and R56 and on the E60, E61, E63, E64 from 09/2005

In this case, "virtual" means that this is not a real control unit but a wild card for all control units on the CAN bus or **byteflight**.

- The short test for this "virtual" control unit reads the communication fault from all control units.
- An "x" in front of this "virtual" control unit indicates that the short test has analysed one of the following faults:
  - No communication with the respective gateway (data interface for all busses):
    - > R56

JBE: Junction box electronics

> E87 or E90, E91, E92, E93

JBE: Junction box electronics

- Breaks in the wiring in a bus
- Intermittent fault in a control unit

## Functions of bus system analysis

Bus system analysis is a test module that automatically executes the following steps:

### Step 1: Identification of engine type

Identifying the engine type is a prerequisite for bus system analysis, since different engines generate different fault code memory entries for the same cause of fault.

### Step 2: Read fault memories of all control units

### Step 3: Check fault memory entries for undervoltage

If the vehicle has suffered an undervoltage, the undervoltage is the most likely cause of the bus failure. Bus system analysis checks whether a fault memory entry indicating undervoltage is present in at least 2 control units.

If no undervoltage can be detected, continue with step 4.

### Step 4: Check how many fault memory entries were found

If at least 1 fault memory entry is present, continue with step 5.

### Step 5: Evaluation of fault memory entries and creation of a list of most probable fault causes

Bus system analysis computes the 3 most probable fault causes.

The 3 most probable fault causes are given in a list.

The most probable fault cause is at the top of the list.

#### Message in the BMW diagnosis system

The fault causes detected are as follows:

- [1] \*\* \* Cause of fault PT-CAN
- [2] \*\* Cause of fault ZGM
- [3] \* Cause of fault ...
- [4] End test module

The most probable fault cause is given under [1]. Select inspection step.

*Note: The number of stars denotes priority.*

The stars in front of a cause of fault indicate how probable the cause of fault is. 5 stars denote the most likely cause of fault.

1 star is allocated to a cause of fault that has very low probability.

### Step 6: Selection of the test module

## Terminating resistors

The installation locations are listed below for the purposes of measuring the terminating resistor values.

### > R56

- PT-CAN

- 1 resistor is in the SZL control unit in the version with steering angle sensor (SZL: steering column switch cluster)  
1 resistor is in the EPS control unit (EPS: electro-mechanical power steering)

- F-CAN

- Vehicles with Dynamic Stability Control (DSC)  
1 resistor is in the DSC control unit  
1 resistor is in the DSC sensor (under the front-passenger seat)

### > E60, E61, E63, E64

- PT-CAN

- 1 resistor is in the DSC control unit (DSC: dynamic stability control)  
1 resistor is in the SGM control unit (safety and gateway module)  
From 09/2005, this resistor is in the KGM control unit (body-gateway module)

- F-CAN

- Vehicles with AS (Active Steering)  
1 resistor is in the cumulative steering-angle sensor in the steering box.  
1 resistor is in the DSC sensor (under the front passenger seat).
- Vehicles without AS (Active Steering)  
1 resistor is in the DSC control unit (DSC: Dynamic Stability Control)  
1 resistor is in the DSC sensor 2 (under the front-passenger seat; DSC sensor 1 is under the driver's seat).

### > E65, E66

- PT-CAN

- 1 resistor is in the wiring harness at the front on the right spring strut dome.  
This resistor can be disconnected from the PT-CAN.
- 1 resistor is in the wiring harness under the back seat.  
This resistor cannot be disconnected.

### > E87, E90, E91, E92, E93

- PT-CAN

Different terminating resistors are used depending on the motorisation:

- Vehicles with engine N4... (basic variant and High equipment)  
1 resistor is in the DSC control unit (DSC: Dynamic Stability Control)  
1 resistor is in the JBE control unit (JBE: junction box electronics)
- Vehicles with engine M47, M57, N5... (basic variant and High equipment)  
1 resistor is in the DSC control unit (DSC: Dynamic Stability Control)  
1 resistor is in the EKP control unit (EKP: controlled fuel pump)

- Vehicles with engine N4... (basic variant and High equipment)
  - 1 resistor is in the SZL control unit (SZL: steering column switch cluster)
- Vehicles with engine M47, M57, N5... (basic variant and High equipment)
  - 1 resistor is in the DSC control unit (DSC: Dynamic Stability Control)
  - 1 resistor is in the SZL control unit (SZL: steering column switch cluster)

## MOST system analysis

The MOST bus has a ring structure. This means that a fault in one control unit can have an effect on the entire system. The cause of a system fault (= communication fault) in the MOST network is not readily apparent.

The "MOST system analysis" test module (BMW diagnosis system from DIS CD 36) was developed in order to analyse faults in the communication of MOST control units.

The MOST system analysis has been improved in DIS-CD 38.

*Note: Path details for the "MOST system analysis" test module*

The test module is called up in the DIS (Diagnosis and Information System) as follows:

"Function selection" button -> Complete vehicle -> Body -> Bus functions -> MOST functions -> MOST system analysis.

In order to determine the cause of a system fault in the MOST network, the following prerequisites have been established:

- If a communication fault occurs in MOST control units, then this communication fault is not shown in the fault memory of the control unit concerned. This also means that no "x" appears before this control unit in the short test.
- In addition to the list of "really" fitted control units in the short test, a "virtual" control unit appears called "MOST system analysis".  
In this case, "virtual" means that this is not a real control unit, but a wild card for all MOST control units.
- The short test for the "MOST system analysis" "virtual" control unit reads the communication faults of all the MOST control units.
- An "x" in front of this "MOST system analysis" "virtual" control unit indicates that the short test has analysed one of the following faults:
  - No communication with the following control units:
    - > R56  
CCC: Car Communication Computer  
RAD2: radio 2 (Radio Boost)
    - > E60, E61, E63, E64  
CCC or M-ASK: car communication computer or multi-audio system controller
    - > E65, E66  
CD: Control Display
    - > E87, E90, E91, E92, E93  
CCC or M-ASK: car communication computer or multi-audio system controller  
RAD2: radio 2 (BMW "Professional" radio)
  - MOST ring break

**Functions of MOST system analysis**

The "MOST system analysis" test module follows the following sequence:

**Step 1: Read fault code memories of MPM, KGM, PM or JBE**

- It first checks whether the communication with the following control units is in order:
  - > R56  
JBE: junction box electronics
  - > E60, E61, E63, E64 up to 09/2005:  
MPM: micro-power module
  - > E60, E61, E63, E64 from 09/2005  
KGM: body gateway module
  - > E65, E66  
PM: power module
  - > E87, E90, E91, E92, E93  
JBE: junction box electronics
- Then the fault memories are read.

The following fault code memory entries are read:

- > R56  
JBE: junction box electronics  
Have the auxiliary consumer units been switched off?
- > E60, E61, E63, E64 up to 09/2005:  
MPM: micro-power module  
Have the auxiliary consumer units been switched off?
- > E60, E61, E63, E64 from 09/2005  
KGM: body gateway module  
Have the auxiliary consumer units been switched off?
- > E65, E66  
PM: power module  
Is there a break in the connection from the control units to the battery?  
Is the battery fully discharged?
- > E87, E90, E91, E92, E93  
JBE: junction box electronics  
Have the auxiliary consumer units been switched off?

**Step 2: Check communication with CD or CCC or M-ASK or RAD2**

A check is performed as to whether the communication with the following control units is OK:

- > R56  
CCC or RAD2: Car Communication Computer or radio 2 (Radio Boost)
- > E65, E66  
CD: Control Display

- > E87, E90, E91, E92, E93

RAD2: radio 2 (BMW "Professional" radio)

If there is a problem with the communication, the appropriate fault is displayed.  
The test module is ended.

If communications with the headset are OK, continue with step 3.

(Headset: In the field of automotives, the headset is the user interface for systems that are not essential for driving, for example navigation, mobile telephone or radio. Headset is a collective term for various control units, for example CCC, M-ASK, e.g. in MOST system analysis).

### **Step 3: Check MOST ring**

Is the MOST ring closed?

If the MOST ring has been interrupted a fault message is displayed. The test module is ended and reference given to the ring interruption diagnosis.

If the MOST ring is closed, continue with step 4.

### **Step 4: Check MOST configuration**

This step checks whether the fault "MOST-Ring: desired/actual configuration do not coincide" is stored in the M-ASK (E60), CCC (E60) or CD (E65). Depending on the model series concerned, the fault is stored in the following control units:

- > R56

CCC: Car Communication Computer

RAD2: radio 2 (Radio Boost)

- > E60, E61, E63, E64

CCC or M-ASK: car communication computer or multi-audio system controller

- > E87, E90, E91, E92, E93

CCC or M-ASK: car communication computer or multi-audio system controller

RAD2: radio 2 (BMW radio "Professional")

The test compares the desired configuration of the MOST bus with the actual configuration.

If the actual configuration differs from the desired configuration then the desired configuration for the control units is stored again in the MOST network.

If the desired configuration is stored, continue with the 5th step.

### **Step 5: Analyse fault memory of the MOST control units**

The fault memory entries in all MOST control units are evaluated with regard to communication faults. The evaluation of the fault memory entries present will give the most probable cause of the fault.

At most the 2 most probable causes of the fault (control units) will be given as a result, e.g.:

- CDC CD changer (\*\*\*\*)
- TEL Telephone (\*\*)

Evaluation of quality of results:

(\*\*\*\*\*) stands for high quality (most probable fault)

(\*) stands for poor quality

The number of stars varies between one star and five stars.

The necessary procedure is described.

- General information: ---
- Diagnosis: ---
- Encoding/programming: ---

**Subject to change.**